TECHNICAL REVIEW AND EVALUATION
PHOENIX CEMENT COMPANY
AIR QUALITY PERMIT NO. 1001785

I. INTRODUCTION

The Title V permit is issued to Phoenix Cement Company (PCC), the Permittee, for operation of its Portland cement manufacturing plant located in Yavapai County, Arizona.

A. Company Information

Facility Name: Phoenix Cement Company (PCC)

Facility Address: 3000 West Cement Plant Road
Clarkdale, Arizona 86324

B. Attainment Classification

The air quality control region in which the subject facility is located is classified as being in attainment of the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants including: particulate matter less than 10 microns (PM_{10}), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and ozone (O_3).

II. PROCESS DESCRIPTION

In the existing process, the Portland cement plant utilizes three coal/coke-fired rotary kilns to produce cement from various types of rock, including limestone, volcanic ash, and mill scale. First, limestone and other types of rock are blasted and transported by haul trucks from the quarry to the primary crusher or to stockpiles. Crushed rock is routed to surge piles for subsequent transfer to the secondary crusher. The secondary crusher is used in conjunction with feeders and screens to further reduce the size of the rock before it is sent to the raw mill storage bays.

The crushed rock is conveyed from the storage bays to the raw mill for grinding via the rock bin, elevator, and separator. Meal-size material from the raw mill is transported to the blending system which is composed of two blending silos and one homogenizing silo. The existing separator and raw mill each have a dryer that supplies heated air to these components. From the blending system, the meal is pumped via the alleviator into three bins from which the meal is discharged into the respective kilns.

The heart of the Portland cement manufacturing process is the pyroprocessing system. This

system transforms the raw mix into clinker, which is a gray, glass-hard, spherically shaped nodule. The chemical reactions and physical processes that constitute the transformation are quite complex, but they can be conceptually divided into four stages, as a function of the location and temperature in the rotary kiln.

- Evaporation of uncombined water from raw materials as material temperature increases to 212 degrees Fahrenheit (^{o}F);
- Dehydration, as the material temperature increases from 212^{o}F to approximately 800^{o}F to form oxides of silicon, aluminum, and iron;
- Calcination, during which carbon dioxide (CO_2) is evolved, between 1,650^{o}F and 1,800^{o}F to form free lime (CaO); and
- Reaction of the oxides in the burning zone of the rotary kiln to form cement clinker at temperatures of approximately 2,750^{o}F.

The direct-fired kilns burn a blend of coal and coke. Coal and coke are stored in separate piles from which they are conveyed together into a common crusher. The crushed mixture is sent to three bins that feed three coal mills (one for each kiln). The milled fuel is then air-conveyed directly into the burning zone of each kiln.

Clinker discharges from the kiln into a clinker cooler. Clinker is removed from the clinker cooler by drag chains and moveable grates onto a common conveyor belt that transports it via a stacker to two outdoor storage bays.

For the modernized process, the facility is installing a state-of-the-art FL Smidth (FLS) five-stage, suspension preheater/pre-calciner rotary kiln, in-line raw mill, and clinker cooler system, with associated dust collectors. In addition, they are installing an indirect-fired coal/coke fuel system, and several emission sources in the clinker handling and storage facility will be eliminated by the installation of indoor clinker storage enclosures. There will be no changes to the raw materials crushing and conveying system. A new Onoda-Kobe (OK) vertical roller mill with an elevator and dust collector will be installed for finish grinding.

The facility will be permitted to operate either the existing kiln system (Kilns 1 through 3) *or* the modernized Kiln 4 system during the first 180 days after the commencement of operation of the Kiln 4 system. After the 180 days have expired, PCC will permanently shut down the existing kiln system. Commencement of operation is defined as the date on which the production of cement begins.

III. EMISSIONS

Table III.A presents a summary of the maximum allowable annual emissions from the modernization project.

Table III.A

Emission Unit	PM Emissions *(tons/yr)*	PM_{10} Emissions *(tons/yr)*	CO Emissions *(tons/yr)*	NO_x Emissions *(tons/yr)*	SO_2 Emissions *(tons/yr)*	VOC Emissions *(tons/yr)*
Raw Material Primary & Secondary Crushing & Storage	6.30	4.40				
Raw Material Storage/ Handling	18.03	13.52				
Raw Grinding System No. 1	4.51	33.80				
Raw Grinding System No. 2	33.61	25.16				
Blending and Kiln Feeding	17.51	13.12				
Kiln Feed	10.74	8.05				
Raw Grinding System No. 3	72.08	60.40				
Pyroprocessing System	104.00	77.70	674.52	1,742.51	281.05	34.85
Clinker Transport	11.38	8.54				
Clinker Storage & Transport	12.87	10.11				
Coal & Coke Handling & Grinding	13.57	10.18				
Coal & Coke Grinding & Firing	22.95	17.23	91.98	237.62	38.33	4.75
Mill Feed/Clinker & Gypsum Handling	20.30	16.48				
Finish Mill	51.92	44.17				
Clinker Grinding OK Mill	171.00	128.00				
Sacking	18.87	4.91				
Bulk Loading	5.63	1.46				
Cement Storage	19.0	4.95				
Cooling Towers	0.00	10.71				
Fugitive Sources	123.80	49.44	36.10	9.15	1.08	
Total Facility	**778.64**	**542.34**	**802.60**	**1,989.28**	**320.46**	**39.60**

IV. COMPLIANCE HISTORY

A. Testing and Inspections

Inspections have been conducted on this source to ensure compliance with permit conditions. Table IV.A below summarizes some of the recent inspections that have been conducted on the source and the results of the inspections.

Table IV.A: Inspections

Inspection Date	Type of Inspection	Results
01-28-02	II	Major Air Inspection - Passed
05-25-01	II	Wanted to determine if the facility had commenced construction of Kiln 4; Documented several concrete foundations and partial construction of the preheater/calciner
05-10-01	II	Routine Inspection - Passed
02-06-01	I	A performance test was conducted for particulate matter emissions from the clinker cooler and for particulate matter, SO_2, and NO_x emissions from the Kiln 2 baghouse
11-20-00	II	Major Air Inspection - Passed
11-07-00	I	Performance tests for particulates were performed on Clinker Cooler 3 and Kiln 3; Kiln 3 was also tested for SO_2 and NO_x
01-10-00	II	Major Air Inspection - Passed
10-27-99	I	Collection of fibrous debris from screens and counter tops in the house
09-30-99	I	Performance tests for particulates and opacity were conducted on the DC 601 Dust Collector on the raw material blending silos
04-13-99	II	Emission tests were conducted on Clinker Cooler 2 and Kiln 2

B. Excess Emissions

Reports of excess emissions are outlined in Table IV.B below for the most recent three years.

Table IV.B: Excess Emission Reports

Date	Excess Emission Reported	Cause
05-30-01	100% Opacity	A hole developed in the cement transport line due to internal erosion of the pipe
04-07-00	100% Opacity	Start-up/Load Ramping; Normal operation was achieved after start-up

V. APPLICABLE REQUIREMENTS

The facility is a major source under Arizona Administrative Code (A.A.C.) R18-2-302 because it has the potential to emit (PTE) greater than 100 tons per year for CO, nitrogen oxide (NO_x), SO_2, particulate matter (PM), and PM_{10}. As a major source, the facility is subject to all requirements under A.A.C. R18-2-302.

A. Maximum Available Control Technology (MACT)

Title 40, Part 63, Subpart LLL of the Code of Federal Regulations (CFR), *National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry*, is applicable to Kiln 4 and associated equipment upon startup. It is applicable to Kilns 1 through 3 and associated equipment on June 10, 2002. The applicable requirements associated with this standard include the applicable provisions of the MACT *General Provisions*, 40 CFR Part 63, and the following:

§63.1343, "Standards for Kilns and In-Line Kiln/Raw Mills," establishes the following limits:

- A particulate matter emission limit of 0.15 kg per mg (0.30 lb per ton);
- An opacity limit of 20 percent; and
- A dioxins/furans limit of 0.20 ng per dscm ($8.7x10^{-11}$ gr per dscf) (toxicity equivalents (TEQ)) corrected to seven percent oxygen, or 0.40 ng per dscm ($1.7x10^{-10}$ gr per dscf) (TEQ) corrected to seven percent oxygen when the average of the performance test run average temperatures at the inlet to the particulate matter control device (PMCD) is 204°C (400°F) or less.

§63.1344, "Operating Limits for Kilns and In-Line Kiln/Raw Mills," establishes an applicable temperature limit for the in-line kiln/raw mill, i.e. Kiln 4, when the raw mill is operating and when it is not. In the case of Kilns 1 through 3, it establishes an applicable temperature limit for the gas at the inlet to the kiln PMCD.

§63.1345, "Standards for Clinker Coolers," establishes the following limits for the clinker coolers:

- A particulate matter emission limit of 0.050 kg per mg (0.10 lb per ton); and
- An opacity limit of 10 percent.

§63.1346, "Standards for New and Reconstructed Raw Material Dryers," establishes an opacity limit of 10 percent for the raw material dryers.
§63.1347, "Standards for Raw and Finish Mills," establishes an opacity limit of 10 percent for the raw and finish mills.

§63.1348, "Standards for Affected Sources other than Kilns; In-Line Kiln/Raw Mills; Clinker Coolers; New and Reconstructed Raw Material Dryers; and Raw and Finish Mills," establishes an opacity limit of 10 percent for emissions from any raw material, clinker, or finished product storage bin, conveying system transfer point, bagging system, and bulk loading or unloading system.

§63.1349, "Performance Testing Requirements," establishes the following:

- Within 180 days of startup, initial compliance with the emission standards shall be demonstrated. The performance test plan shall be available to the Director prior to testing, and the results shall be documented in complete test reports.
- For Kiln 4, compliance with the particulate matter emission standards shall be demonstrated using Environmental Protection Agency (EPA) Reference Method 5 with an average of three separate runs which are each at least one hour in length at the highest capacity reasonably expected to occur. Tests shall be performed when the raw mill of the in-line kiln/raw mill is under normal operating conditions and when it is not operating. For Kilns 1 through 3, compliance shall be demonstrated using EPA Reference Method 9 with 30 six-minute averages at the highest capacity reasonably expected to occur. The test may be reduced to 1-hour if there are no individual reading greater than 10 percent and there are no more than 3 reading of 10 percent for the first 1-hour period.
- Compliance with the dioxins/furans emission standards shall be demonstrated using EPA Reference Method 23 with an average of three separate runs which are at least three hours in length at the highest capacity reasonably expected to occur. For Kiln 4, tests shall be performed when the raw mill of the in-line kiln/raw mill is under normal operating conditions and when it is not operating.
- Performance tests shall be repeated every five years except for the required initial performance test of opacity for the kiln or clinker cooler.
- Dioxin/furan performance tests shall be repeated every 30 months.
- For the kiln, a particulate matter and dioxin/furan performance test shall be repeated within 90 days of initiating any significant change in the feed or fuel from that of the previous performance test.

§63.1350, "Monitoring Requirements," establishes the following:

- For Kiln 4, a continuous opacity monitor (COM) will be located at the outlet of the PM control device. It needs to be installed, maintained, calibrated, and operated in accordance with Subpart A of 40 CFR 63 and PS-1 of Appendix B of 40 CFR 60. For Kilns 1 through 3, there is the option of using EPA

Reference Method 9 visual opacity observations for at least 30 minutes each day. The opacity standard is set at 20 percent on a 6-minute average in either case.

- For Clinker Cooler 4, a COM will be located at the outlet of the PM control device. It needs to be installed, maintained, calibrated, and operated in accordance with Subpart A of 40 CFR 63 and PS-1 of Appendix B of 40 CFR 60. For Kilns 1 through 3, there is the option of using EPA Reference Method 9 visual opacity observations for at least 30 minutes each day. The opacity standard is set at 10 percent on a 6-minute average in either case.
- For the raw mill or finish mill, a 6-minute daily visual emissions observation of the mill sweep and air separator PMCDs needs to be performed in accordance with EPA Reference Method 22 while operating at the highest capacity expected to occur within the day. If visual emissions are observed, corrective actions need to be taken and, within 24 hours, a 30-minute EPA Reference Method 9 test needs to be conducted for each stack in which visible emissions were observed.
- A continuous temperature monitor shall be used to record the temperature of the exhaust gases from the kiln.
- An inspection of the components of the combustion system of the kiln shall be performed at least once per year.
- Opacity shall be monitored in accordance with the operations and maintenance plan.

§63.1353, "Notification Requirements," establishes the following:

- Applicable notification provisions are listed in Table 1 to Subpart LLL in 40 CFR 63.
- Notification requirements in 40 CFR 63.9 shall be followed as follows:
  - Initial notification as required by 40 CFR 63.9(b) through (d) which can be made through a Title V permit application if it contains the same information;
  - Notification of performance tests as required by 40 CFR 63.7;
  - Notification of opacity and visible emission observations in accordance with 40 CFR 63.6(h)(5) and 40 CFR 63.9(f);
  - Notification, as required by 40 CFR 63.9(g), of the date that the continuous emission monitoring system (CEMS) performance evaluation required by 40 CFR 63.8(e) is scheduled to begin; and
  - Notification of compliance status as required by 40 CFR 63.9(h).

§63.1354, "Reporting Requirements," establishes the following:

- All reporting provisions are included in Table 1 to Subpart LLL in 40 CFR 63.

- Reports need to comply with the requirements specified in 40 CFR 63.10 as follows:
  - Report results of performance tests as a part of the notification of compliance status as required by 40 CFR 63.10(d)(2);
  - Report opacity results as required by 40 CFR 63.10(d)(3);
  - Progress reports as a condition of receiving an extension of compliance as required by 40 CFR 63.10(d)(4);
  - If actions during a start-up, shut down, or malfunction are consistent with the plan specified in 40 CFR 63.6(e)(3), a statement shall be made in a semi-annual report as required by 40 CFR 63.10(d)(5). Reports shall be submitted with the excess emissions and continuous monitoring system performance reports if a start-up, shut down, or malfunction occurred during the reporting period;
  - An immediate report shall be made within 2 working days if actions during a start-up, shut down, or malfunction are not consistent with the plan;
  - A written report of the results of the performance evaluation for the continuous monitoring system as required by 40 CFR 63.10(e)(2) shall be submitted simultaneously with the results of the performance test;
  - If applicable, report the results of the COM system performance evaluation conducted under 40 CFR 63.8(e) as required by 40 CFR 63.10(e)(2);
  - An excess emissions and continuous monitoring system (CMS) performance report for any event in which the data indicates the source is not in compliance shall be submitted as required by 40 CFR 63.10(e)(3);
  - A semi-annual summary report shall be submitted with the compliance certification which includes the information specified in 40 CFR 63.10(e)(3)(vi), all exceedances of maximum control device inlet gas temperature limits, all failures to calibrate thermocouples and other temperature sensors, the results of any combustion system component inspections, and all failures to comply with any provision of the operation and maintenance plan; and
  - An excess emissions and CMS performance report if the total continuous monitoring system down time for any CEMS or any CMS for the reporting period is 10 percent or greater of the total operating time of the reporting period.

§63.1355, “Record Keeping Requirements,” establishes the following:

- All files, including reports and notifications, shall be retained for at least five years.

- Records shall be maintained and shall include documentation supporting initial notifications and notifications of compliance status, applicability determinations with supporting analyses, and any information demonstrating whether to source is meeting any requirements for a waiver or record keeping or reporting requirements.
- Records shall be maintained for all continuous monitoring systems as required by 40 CFR 63.10(c) and those mentioned above.

B. New Source Performance Standards (NSPS)

40 CFR Part 60 Subpart F, *Standards of Performance for Portland Cement Plants*, is not applicable to the Kiln 4 system per 40 CFR 63.1356(a).

40 CFR Part 60 Subpart Y, *Standards of Performance for Coal Preparation Plants*, is applicable for the coal preparation operations. The applicable requirements associated with these standards include the applicable provisions of the NSPS *General Provisions*, 40 CFR Part 60, Subpart A and the following:

§60.252, "Standards for Particulate Matter," establishes the following:

- A particulate matter emission limit of 0.70 g per dscm (0.031 gr per dscf) from the thermal dryer; and
- An opacity limit of 20 percent from the thermal dryer, any coal processing and conveying equipment, coal storage system, and coal transfer and loading system processing coal.

§60.253, "Monitoring of Operations," establishes the following:

- Installation, calibration, maintenance, and continuously operate a monitoring device for the measurement of the temperature of the gas stream at the exit of the thermal dryer within ± 3 ^{o}F.
- All monitoring devices shall be re-calibrated annually in accordance with the procedures of 40 CFR 60.13(b).

§60.254, "Test Methods and Procedures," establishes the following:

- When conducting performance tests required in 40 CFR 60.8, use reference methods and procedures in Appendix A of 40 CFR 60 except as provided in 40 CFR 60.8(b).
- Determine particulate matter standards and opacity compliance using EPA Reference Method 5 and Method 9, incorporating procedures in 40 CFR 60.11, respectively. For Method 5, the sampling time and volume for each

run shall be at least 60 minutes and 0.85 dscm (30 dscf), respectively. Sampling should begin no less than 30 minutes after start-up and shall terminate prior to beginning shut-down procedures.

40 CFR Part 60 Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, is applicable for quarry operations if the equipment was manufactured or modified after August 31, 1983. The applicable requirements associated with these standards include the applicable provisions of the NSPS *General Provisions*, 40 CFR Part 60, Subpart A and the following:

§60.672, "Standard for Particulate Matter," establishes the following:

- A particulate matter emission limit of 0.05 g per dscm and an opacity limit of 7% of stack emissions from any transfer point on the belt conveyors, any other affected source, and any multiple storage bins with combined stack emissions;
- An opacity limit of 10% of fugitive emissions from any transfer point on the belt conveyors or any other affected source;
- An opacity limit of 15% of fugitive emissions from any crusher;
- If the affected facility is enclosed in a building, there should be no visible emissions except emissions from a vent (defined in 40 CFR 60.671), and should meet the stack emission limits discuss in the first point above;
- An opacity limit of 7% of stack emissions from any baghouse that controls emissions fro an individual, enclosed storage bin; and
- No visible emissions are allowed for wet screening operations and subsequent screening operations, bucket elevators, and belt conveyors that process saturated material in the production line, and screening operations, bucket elevators, and belt conveyors in the production line downstream of wet mining operations.

§60.675, "Test Methods and Procedures," establishes the following:

- When conducting performance tests required in 40 CFR 60.8, use reference methods and procedures in Appendix A of 40 CFR 60 except as provided in 40 CFR 60.8(b);
- Alternative methods and procedures for conducting performance tests including using EPA Reference Method 5 or EPA Reference Method 17 to determine the particulate matter concentration and Method 9 and 40 CFR 60.11 to determine opacity;
- Use EPA Reference Method 9 and 40 CFR 60.11 to determine compliance with the opacity standards for fugitive emissions;
- Use EPA Reference Method 9 to determine compliance with the opacity

standards for stack emissions of particulate matter from any baghouse that controls emissions from an individual storage bin using ten 6-minute averages;

- The duration of the EPA Reference Method 9 observations for determining compliance with the opacity limit for fugitive emissions from any transfer point on belt conveyors or from any other affected facility can be reduced from thirty 6-minute averages to ten 6-minute averages if no individual readings are greater than 10 percent opacity and there are no more than 3 readings of 10 percent for the 1-hour period;
- The duration of the EPA Reference Method 9 observations for determining compliance with the opacity limit for fugitive emissions from any crusher at which a capture system is not used can be reduced from thirty 6-minute averages to ten 6-minute averages if no individual readings are greater than 15 percent opacity and there are no more than 3 readings of 15 percent for the 1-hour period;
- Use EPA Reference Method 22 to determine compliance with emissions from any transfer point on a conveyor belt or any other affected facility enclosed in a building with each side of the building and the roof being observed for at least 15 minutes;
- Use the highest fugitive opacity standard applicable to any individual affected facility for the combined emission stream or separate the emissions so that the opacity from each affected facility can be read if emissions from two or more facilities continuously interfere so that the opacity of fugitive emissions from individual affected facilities cannot be read;
- Submit a notice to the Director at least 7 days prior to any rescheduled performance test if a performance test is delayed; and
- Initial EPA Reference Method 9 tests are not required for wet screening operations and subsequent screening operations, bucket elevators, and belt conveyors that process saturated material in the production line, and screening operations, bucket elevators, and belt conveyors in the production line downstream of wet mining operations.

§60.676, "Reporting and Recordkeeping," establishes the following:

- Submit information to the Director about the existing facility being replaced and the replacement piece of equipment for any crusher, grinding mill, bucket elevator, bagging operation, enclosed truck or railcar loading station, screening operation, conveyor belt, and storage bin;
- Submit written reports of the results of all performance tests; and
- Submit a report of a change in processing saturated material to unsaturated material within 30 days following the change and the screening operation, bucket elevator, or belt conveyor is then subject to a 10 percent opacity limit

and the emission test requirements of 40 CFR 60.11 and those within the permit, or submit a report of a change in processing unsaturated material to saturated material within 30 days following the change and the screening operation, bucket elevator, or belt conveyor are subject to a no visible emission limit.

C. Compliance Assurance Monitoring (CAM)

This regulation requires monitoring for the various particulate matter sources which have an uncontrolled PTE greater than 100 tons per year. The CAM plan is discussed in detail in Section V.B herein.

D. Emissions from Non-Point Sources

Title 18, Chapter 2, Article 6 of the Arizona Administrative Code establishes restrictions on emissions from non-point sources. The following provisions are incorporated into the proposed permit:

- A.A.C. R18-2-602 prohibits open outdoor fires;
- A.A.C. R18-2-604 through A.A.C. R18-2-607 restricts fugitive dust emissions from such sources as open areas, parking lots, roadways and streets, material handling operations, and storage piles; and
- A.A.C. R18-2-612 limits opacity of visible emissions from non-point sources to 40 percent.

E. Existing Stationary Source Performance Standards

Title 18, Chapter 2, Article 7 of the Arizona Administrative Code establishes restrictions on emissions from stationary sources. The following provisions are incorporated into the proposed permit:

- A.A.C. R18-2-702.B.1 limits the opacity of visible emissions from the quarry to 40 percent.
- A.A.C. R18-2-705.B limits the amount of particulate matter emissions from Kilns 1 through 3 using process weight rate equations.
- A.A.C. R18-2-705.C limits the opacity of visible emissions from Kilns 1 through 3 to 20 percent.
- A.A.C. R18-2-705.D limits the amount of sulfur dioxide emissions from Kilns 1 through 3 to 6 pounds per ton of cement kiln feed.
- A.A.C. R18-2-705.F.1 through -705.F.4 provides the applicable test methods and procedures that should be utilized during performance tests.
- A.A.C. R18-2-705.E requires record keeping of the daily total kiln feed rate.
- A.A.C. R18-2-722.B limits the amount of particulate matter emissions from the quarry operations using process weight rate equations.

- A.A.C. R18-2-722.D requires placement of spray bars and nozzles as required by the Director to minimize air pollution.
- A.A.C. R18-2-722.F requires the installation, calibration, maintenance, and operation of monitoring devices to determine the daily process weight of gravel or crushed stone produced to an accuracy of ± 5 percent.
- A.A.C. R18-2-722.G requires record keeping of the daily total of crushed material produced in tons.
- A.A.C. R18-2-722.H provides the applicable test methods and procedures that should be utilized during performance tests.
- A.A.C. R18-2-730.A limits the amount of particulate matter emissions from unclassified point sources (i.e. those sources without any other applicable conditions from the NSPS, MACT, or other Existing Stationary Performance Standards) using process weight rate equations.
- A.A.C. R18-2-730.B states the total process weight from all similar units with a similar process shall be used when determining particulate matter emissions.
- A.A.C. R18-2-730.D states gaseous or odorous materials shall not be released in such quantities or concentrations as to cause air pollution.

F. Emissions from Mobile Sources (New and Existing)

Title 18, Chapter 2, Article 8 of the Arizona Administrative Code establishes restrictions on emissions from mobile sources other than motor vehicles and agricultural equipment. The following provisions are incorporated into the proposed permit:

- A.A.C. R18-2-804 limits opacity of visible emissions from roadway and site-cleaning machinery to 40 percent and requires reasonable precautions against airborne particulate matter from site or roadway cleaning operations.

G. Voluntarily Accepted Permit Conditions

Title 18, Chapter 2, Article 3 of the Arizona Administrative Code establishes the option for a source to voluntarily accept emission limitations and standards in order to avoid federally applicable requirements. In this case, the source has opted to incorporate conditions into their permit in order to avoid classification as a Prevention of Significant Deterioration (PSD) significant revision. The following table identifies the condition and the purpose for placing it in the permit. The appropriate monitoring, record keeping, and reporting requirements have been included to ensure that the voluntarily accepted emission limitations and standards are met.

Table IV.A: Voluntarily Accepted Permit Conditions

Condition	Purpose
The source cannot operate Kilns 1, 2, and 3 and Clinker Coolers 1, 2, and 3 while Kiln 4 and Clinker Cooler 4 is in operation.	This condition was established in accordance with their PTE calculations.
Kilns 1, 2, and 3 and Clinker Coolers 1, 2, and 3 shall be permanently shut down 180 days after start-up of Kiln 4 and Clinker Cooler 4.	The existing system will need to be permanently shut down in order to be considered a creditable net emissions decrease for purposes of netting out of PSD review. The length of this shake down period was established based on A.A.C. R18-2-312.A which states that performance tests must be completed within 60 days after the source has achieved full capacity, but no later than 180 days after the initial startup of the source.
Carbon monoxide emissions from Kiln 4 shall not exceed 767 tons per year.	The source selected a Best Available Control Technology (BACT) - like carbon monoxide annual limit which was utilized in the PTE calculations. The emission limit was calculated based on the manufacturer's guarantee.
Sulfur dioxide emissions from Kiln 4 and the Coal Mill shall be limited to 0.5 lb per ton of clinker during any calendar month.	This emission factor was used to calculate the annual PTE for the kiln and coal mill. The emission limit was calculated based on the manufacturer's guarantee.
The standby raw mill shall not operate when the in-line raw mill is operating.	This is an alternate operating scenario that was requested by the source in their permit application.
The swing mill shall not operate for the purpose of raw grinding when the in-line raw mill is operating.	This is an alternate operating scenario that was requested by the source in their permit application.
All equipment shall be operated in accordance with manufacturer's specifications.	This condition was established in accordance with their PTE calculations.
The facility can only utilize coal, pet-coke, #2 fuel oil, and natural gas as fuel. The maximum fuel proportion in percent heat input is limited to 60 percent for pet-coke.	These fuel limitations were requested by the source in their permit application.
Carbon monoxide emissions from Kiln 4 shall be limited to 2 pounds per ton (lb per ton) of clinker on an 8-hour rolling average as measured by a CEMS.	The source selected a BACT-like carbon monoxide 8-hour rolling average limit which was used in the modeling portion of the permitting process. The emission limit was calculated based on the manufacturer's guarantee.

Condition	Purpose
Kiln 4 will be operated in accordance with the manufacturer's specified operating procedures to ensure good combustion practice.	In order to meet the BACT-like carbon monoxide limit discussed above, the kiln will need to be operated in accordance with good combustion practices.
Clinker domes will be installed and maintained to minimize visible emissions.	The source installed clinker domes in order to reduce particulate matter for purposes of netting out of PSD analysis.
A COM shall be used to measure the stack exhaust opacity of the Coal Mill stack.	This permit condition is necessary to meet the requirements of 40 CFR 63, Subpart LLL.
A continuous flow rate monitor shall be installed on the Kiln 4/Coal Mill stack to measure the Kiln 4 exhaust gas flow rate by-passed through the Coal Mill.	This permit condition is necessary to meet the requirements of 40 CFR 63, Subpart LLL.
The SO_2 emission rate from Kiln 4 and the Coal Mill will be calculated using the most conservative pre-heater and rolling mill SO_2 removal efficiencies to determine the monthly SO_2 emissions.	The SO_2 emission factor used in the PTE calculations is based on a conservative calculation by the manufacturer. The purpose of this monitoring is to ensure that the actual SO_2 emission rate is reflective of the one used in the calculations.
The raw feed will be sampled daily prior to it entering the raw mill. These samples will be analyzed to determine the sulfur content.	The purpose of this monitoring is to determine the sulfur content of the raw feed which will be used in the SO_2 emission rate calculation required in the previous permit condition.
Explosives shall be limited to 10 tons per day.	This condition was established in accordance with their PTE calculations.

VI. PREVIOUS PERMIT CONDITIONS

Table VI.A below outlines the permits that have been issued to the source. The subsequent tables cross reference the previous permit conditions to their location in the new permit. If a condition from the previous permit is deleted, or if a new standard became applicable, comments are provided explaining the reasoning.

Table VI.A: Previous Permits Issued to Phoenix Cement Company

Date Permit was Issued	Permit Number	Application Basis
04-18-89	0369-90	Operating Permit
12-18-92	0381-95	Operating Permit
06-21-95	0381P1-00	Administrative Revision to Permit No. 0381-95
09-10-96	1000385	Minor Revision to Permit No. 0381-95
08-28-98	1000836	Minor Revision to Permit No. 0381-95
04-02-99	1000995	Minor Revision to Permit No. 0381-95
09-01-00	1001001	Significant Revision to Permit No. 0381-95
04-20-00	1001181	Minor Revision to Permit No. 0381-95
02-26-02	1001717	Significant Revision to Permit No. 1001001

Table VI.B: Permit Number 0381-95

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att A - I		X		Facility operation requirements
Att A - II		X		Excess emission reporting requirements
Att A - III		X		Right of entrance for inspections
Att A - IV		X		Transfer of ownership
Att A - V		X		Permit posting requirements
Att A - VI			X	Requirements for permit revisions
Att A - VII			X	Permit renewal requirements
Att B - I			X	Applicable regulations
Att B - II.A			X	Particulate matter, sulfur dioxide, and carbon monoxide emission limitations
Att B - II.B	X			Maximum allowable emission rates
Att B - II.C	X			Definition of excess emissions
Att B - II.D	X			Tire Burning Conditions
Att B - III			X	Stack sampling requirements
Att B - IV			X	Performance testing requirements
Att B - V	X			CEM requirements for Kilns burning tires

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - VI			X	Fuel usage limitations
Att B - VII.A	X			Heat input limit for kilns when burning tires
Att B - VII.B		X		Record keeping requirements
Att B - VII.C	X			Report required 30 days after permit issuance
Att B - VIII			X	Fuel analysis requirement
Att B - IX		X		Ambient monitoring requirements
Att B - X	X			Dispersion modeling requirements for NO_2 and SO_2
Att B - XI.A	X			Requirement to operate DC 404, DC 405, and DC 407 for Kilns 1, 2, and 3
Att B - XI.B	X			Requirement to operate DC 473, DC 478, and DC 483 for Clinker Coolers 1, 2, and 3
Att B - XI.C			X	Requirement to operate and maintain all other baghouses and controls currently used at the facility
Att B - XIII			X	Opacity requirement for any fugitive and/or point emission from any source within the facility; Requirement to submit report on using an alternative to copper smelter slag in the raw material feed

Table VI.C: Permit Number 0381P1-00

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att A - I		X		Facility operation requirements
Att A - II		X		Excess emission reporting requirements
Att A - III		X		Right of entrance for inspections
Att A - IV		X		Transfer of ownership
Att A - V		X		Permit posting requirements
Att A - VI			X	Requirements for permit revisions
Att A - VII			X	Permit renewal requirements
Att B - I			X	Applicable regulations
Att B - II.A		X		Particulate matter emission limitations
Att B - II.B	X			Maximum allowable emission rates
Att B - II.C	X			Definition of excess emissions
Att B - III			X	Stack sampling requirements

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - IV			X	Performance testing requirements
Att B - VI			X	Fuel usage limitations
Att B - VII.A		X		Record keeping requirements
Att B - VII.C	X			Report required 30 days after permit issuance
Att B - VIII			X	Fuel analysis requirement
Att B - IX		X		Ambient monitoring requirements
Att B - X	X			Dispersion modeling requirements for NO_2 and SO_2
Att B - XI.A	X			Requirement to operate DC 404, DC 405, and DC 407 for Kilns 1, 2, and 3
Att B - XI.B	X			Requirement to operate DC 473, DC 478, and DC 483 for Clinker Coolers 1, 2, and 3
Att B - XI.C			X	Requirement to operate and maintain all other baghouses and controls currently used at the facility

Table VI.D: Permit Number 1000385

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - I	X			Requirement to comply with Permit No. 0381-95
Att B - II	X			Notification requirements for startup of replacement parts
Att B - III			X	Opacity limit for conveyor belts
Att B - IV.A		X		Requires Method 9 to determine opacity
Att B - IV.B			X	Requires performance testing if opacity is greater than 15% at the conveyor transfer points

Table VI.E: Permit Number 1000836

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - XII.A.1	X			Initial performance test for DC 601
Att B - XII.A.2		X		Test methods to determine particulate matter concentration and opacity
Att B - XII.B.1	X			Notification requirement if capacity of DC 601 is increased
Att B - XII.B.2	X			Report initial performance test results

Table VI.F: Permit Number 1000995

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - I.A.1			X	Opacity limit for DC 343
Att B - I.A.2			X	Particulate matter emission limit for DC 343
Att B - I.B			X	Maintenance, installation, and operation requirement for DC 343
Att B - I.C.1	X			Requirement to site person certified in Method 9 within 180 days of issuance
Att B - I.C.2			X	Opacity monitoring requirements
Att B - I.C.3.a			X	Requirement to operate DC 343 in accordance with manufacturer's specifications
Att B - I.C.3.b			X	Maintenance records requirement
Att B - I.D	X			Performance test requirement for DC 343

Table VI.G: Permit Number 1001001

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att A			X	Most recent version of Att A will be used
Att B - I			X	List of applicable requirements
Att B - II.A	X			Definition of affected facilities
Att B - II.B.1		X		Particulate matter, opacity and dioxins/furans limits for Kiln 4/In-Line Raw Mill
Att B - II.B.2		X		Particulate matter and opacity limits for the Clinker Cooler
Att B - II.B.3			X	Opacity limit for other affected facilities
Att B - II.B.4	X			Opacity limit for other affected facilities
Att B - II.B.5			X	Particulate matter and opacity limits for the Crushed Stone Processing Plants
Att B - II.B.6			X	Particulate matter and opacity limits for the Coal Preparation Plant
Att B - II.B.7		X		Particulate matter and opacity limits for any other facilities
Att B - II.B.8			X	Opacity limit and operating requirements for Non-Point Emission Sources

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - II.B.9.a	X			Particulate matter emission limits for baghouses
Att B - II.B.9.b		X		Requirement for installation of Clinker Domes
Att B - II.B.9.c	X			Unpaved roads watered once per hour
Att B - II.B.9.d	X			No visible emissions from unpaved and quarry roads
Att B - II.C			X	SO_2 emission limit based on CEMS
Att B - II.D			X	CO emission limit based on CEMS
Att B - II.E	X			NO_x limit based on CEMS
Att B - II.F				Definition of excess emissions
Att B - III.A	X			Quarry production limit
Att B - III.B			X	Quarry explosives limit
Att B - III.C	X			Raw feed usage limit
Att B - III.D		X		Modern and existing system cannot operate concurrently
Att B - IV.A			X	Types of fuel usage limitation
Att B - IV.B	X			Requirement that other fuels cannot be used without Department approval
Att B - V.A.1		X		Record raw material processed per hour
Att B - V.A.2		X		Record clinker produced per day
Att B - V.A.3		X		Record type and amount of each fuel component utilized per day
Att B - V.A.4			X	Record 30-day rolling average CO, NO_x, and SO_2 emissions based on CEMS
Att B - V.A.5	X			Record monthly and annual production for the quarry
Att B - V.A.6			X	Record daily and annual ANFO usage at the quarry
Att B - V.A.7	X			Maintain daily logs of water hour meter readings of water trucks
Att B - V.A.8			X	Record activities to control non-point source emissions or maintain a Non-Point Source Monitoring Plan

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - V.B			X	Requirement for weekly survey of visible emissions from baghouses listed in Condition II.B.8
Att B - V.C			X	Maintain record of start-up, shutdowns, and malfunctions for Kiln 4 and associated clinker cooler
Att B - V.D.1			X	Requirement for a semi-annual compliance certification report
Att B - V.D.2			X	Requirement to report actions taken during a start-up, shutdown, or malfunction
Att B - V.D.3	X			Comply with notification requirements of 40 CFR 60.7(a)(1), (2), and (3)
Att B - V.E		X		All records need to be kept for 5 years with most recent 2 years on site
Att B - VI.A.1		X		COMS required to measure stack gas opacity on Kiln 4/In-Line Raw Mill stack
Att B - VI.A.2		X		COMS required to measure stack gas opacity on Kiln 4/Coal Mill stack
Att B - VI.A.3	X			COMS required to measure stack gas opacity on Clinker Cooler stack
Att B - VI.A.4	X			COMS required to measure stack gas opacity on Finish Mill stack
Att B - VI.A.5			X	CO, NO_x, SO_2, and PM_{10} CEMS required for Kiln 4/In-Line Raw Mill stack
Att B - VI.A.6		X		Continuous temperature monitor required for Kiln 4/In-Line Raw Mill stack
Att B - VI.A.7		X		Continuous flow rate monitor required for Kiln 4/In-Line Raw Mill stack
Att B - VI.B			X	All continuous monitoring systems need to meet performance specifications within 180 days of start-up
Att B - VI.C			X	QA/QC plan needs to be submitted within 30 days prior to instrument start-up
Att B - VI.D			X	Quarterly excess emissions reports required
Att B - VI.E			X	Requirement to maintain file of measurements
Att B - VI.F			X	Record 30-day rolling average CO, NO_x, SO_2, and PM_{10} emissions as recorded by CEMS

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - VII.A.1	X			Initial performance testing requirement for Kiln 4
Att B - VII.A.2			X	Initial and subsequent annual performance testing requirement for CO, NO_x, and SO_2, at certified CEMS location on Kiln 4 stack
Att B - VII.A.3			X	Initial and subsequent annual performance testing requirement for total hydrocarbons, PM_{10}, sulfuric acid mist, hydrogen sulfide, and total reduced sulfur, hydrochloric acid, and dioxin/furan from the baghouse stack for Kiln 4
Att B - VII.A.4			X	Initial performance testing requirement for opacity for Kiln 4
Att B - VII.B.1			X	Initial performance testing requirement for the Coal Mill stack
Att B - VII.B.2			X	Initial and subsequent annual performance testing requirement for total hydrocarbons, CO, NO_x, SO_2, PM_{10}, sulfuric acid mist, hydrogen sulfide, and total reduced sulfur, hydrochloric acid, dioxin/furan, and opacity from the baghouse stack for the Coal Mill
Att B - VII.B.3			X	Initial performance testing requirement for opacity from Coal Mill stack
Att B - VII.C.1			X	Initial and annual performance testing requirement for Clinker Cooler stack
Att B - VII.C.2		X		Initial and annual performance testing requirement PM_{10} for Clinker Cooler stack
Att B - VII.C.3			X	Initial performance testing requirement for opacity from Clinker Cooler stack
Att B - VII.D			X	Initial and subsequent weekly opacity tests to comply with Sections II and V.B
Att B - VII.E	X			Initial performance testing of representative sample of dust collectors from Section II.B.9; and requirement to submit schedule for annual dust collector and baghouse testing
Att B - VII.F		X		Listing of specific test methods
Att B - VIII			X	CAM Requirements
Att B - IX.A	X			Reference to emission limits in Section II.B
Att B - IX.B			X	Comply with operating limits listed in 40 CFR 63.1344

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - IX.C			X	Comply with performance testing requirements listed in 40 CFR 63.1349 and 40 CFR 63.1352
Att B - IX.D			X	Comply with monitoring requirements listed in 40 CFR 63.1350
Att B - IX.E			X	Comply with reporting requirements listed in 40 CFR 63.1354
Att B - IX.F			X	Comply with record keeping requirements listed in 40 CFR 63.1355
Att B - IX.G	X			Comply with general provisions listed in 40 CFR 63, Subpart LLL, Table 1
Att B - X		X		Requirement to continuously operate air pollution control equipment
Att B - XI		X		Ambient Monitoring Requirements

Table VI.H: Permit Number 1001181

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - I.A.1			X	Opacity limit for DC 212
Att B - I.A.2.a	X			Particulate matter limit for DC 212
Att B - I.A.2.b	X			Total gas flow-rate limit for DC 212
Att B - I.B.1			X	Requirement to operate and maintain DC 212 at all times
Att B - I.B.2			X	Malfunctions corrected as soon as possible
Att B - I.B.3	X			Operation and maintenance requirements pursuant to Section 112 of the Clean Air Act are enforceable
Att B - I.B.4		X		Requirement to develop and implement a written start-up, shutdown, and malfunction plan
Att B - I.C.1.a	X			Comply with notification requirements of 40 CFR 63.9
Att B - I.C.1.b		X		Requirement for submission of a written start-up, shutdown, and malfunction plan
Att B - I.C.1.c		X		Information that should be contained in the start-up, shutdown, and malfunction plan

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - I.C.2	X			Comply with monitoring, reporting, and record keeping requirements of Permit No. 1001001 if in renewal of Permit No. 0381-95
Att B - I.D.1			X	Initial performance test for opacity for DC 212
Att B - I.D.2	X			Comply with testing requirements of Permit No. 1001001 if in renewal of Permit No. 0381-95
Att B - II.A.1			X	Opacity limit for DC 213 and DC 214
Att B - II.A.2.a	X			Particulate matter limit for DC 213 and DC 214
Att B - II.A.2.b	X			Total gas flow-rate limit for DC 213 and DC 214
Att B - II.B.1			X	Requirement to operate and maintain DC 213 and DC 214 at all times
Att B - II.B.2			X	Malfunctions corrected as soon as possible
Att B - II.B.3			X	Operation and maintenance requirements pursuant to Section 112 of the Clean Air Act are enforceable
Att B - II.B.4		X		Requirement to develop and implement a written start-up, shutdown, and malfunction plan
Att B - II.C.1.a	X			Comply with notification requirements of 40 CFR 63.9
Att B - II.C.1.b		X		Requirement for submission of a written start-up, shutdown, and malfunction plan
Att B - II.C.1.c		X		Information that should be contained in the start-up, shutdown, and malfunction plan
Att B - II.C.2	X			Comply with monitoring, reporting, and record keeping requirements of Permit No. 1001001 if in renewal of Permit No. 0381-95
Att B - II.D.1			X	Initial performance test for opacity for DC 213 and DC 214
Att B - II.D.2	X			Comply with testing requirements of Permit No. 1001001 if in renewal of Permit No. 0381-95

Table VI.I: Permit Number 1001717

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att A		X		General Provisions
Att B - I.A.1		X		Kiln 4 and Clinker Cooler 4 cannot operate simultaneously with Kilns 1, 2, and 3 and Clinker Coolers 1, 2, and 3
Att B - I.A.2		X		Kilns 1, 2, and 3 and Clinker Coolers 1, 2, and 3 will be permanently shut down 180 days after Kiln 4 and Clinker Cooler 4 begin operating
Att B - I.A.3		X		Kiln 4 CO emission limitation
Att B - I.A.4		X		Kiln 4 and Coal Mill SO_2 limitation
Att B - I.A.5		X		Standby raw mill cannot operate simultaneously with the in-line raw mill
Att B - I.A.6		X		Swing mill cannot operate for purposes of raw grinding when in-line raw mill is operating
Att B - I.A.7		X		All equipment must be operated and maintained according to manufacturer's specifications
Att B - I.A.8		X		Fuel Limitations
Att B - I.B		X		Specifies procedures for performance tests
Att B - I.C.1		X		Record hourly clinker production on 24-hour rolling average for Kiln 4
Att B - I.C.2		X		Record monthly CO emissions in tons from Kiln 4 using CEMS
Att B - I.C.3		X		Record daily clinker production on 30-day rolling average for Kilns 1, 2, and 3
Att B - I.C.4		X		Record type and amount of each fuel component daily for Kiln 4
Att B - I.C.5		X		Record operating hours of standby raw mill, in-line raw mill, and swing mill
Att B - I.C.6		X		Keep manufacturer's specifications on-site
Att B - I.C.7		X		All records need to be kept for 5 years with most recent 2 years on-site
Att B - I.D		X		Notify Director when Kilns 1, 2, and 3 and Clinker Coolers 1, 2, and 3 are shutdown
Att B - II.A.1		X		Emission standards for the In-Line Kiln/Raw Mill
Att B - II.A.2		X		Emission standards for the Clinker Coolers

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - II.A.3		X		Emission standards for the Raw Material Dryers
Att B - II.A.4		X		Emission standards for raw finish mills
Att B - II.A.5		X		Emission standards for material handling points
Att B - II.B.1		X		Use good combustion practices when operating Kiln 4
Att B - II.B.2		X		Install and maintain clinker domes
Att B - II.C.1 - 8		X		MACT monitoring requirements
Att B - II.C.9		X		Use COMS for Kiln 4 and Coal Mill stack
Att B - II.C.10		X		Use CEMS on Kiln4 stack to measure CO emissions
Att B - II.C.11		X		Use continuous flow monitor on Kiln 4 and Coal Mill stack
Att B - II.C.12		X		Requirements for continuous measurement devices
Att B - II.C.13		X		Requirement for a Quality Assurance/Quality Control Plan
Att B - II.C.14		X		Maintain file of measurments
Att B - II.C.15		X		Record 30-day rolling average CO emissions based on CEMS and record hourly raw material feed rate to Kiln 4
Att B - II.D		X		Continuous Assurance Monitoring requirements
Att B - II.E		X		Raw Feed Monitoring Plan
Att B - II.F.1 - 5		X		MACT testing requirements
Att B - II.F.6		X		Annual performance tests for particulate matter from Kiln 4 and Clinker Cooler stacks
Att B - II.G		X		MACT record keeping requirements
Att B - II.H		X		MACT reporting requirements
Att B - II.I		X		MACT notification requirements
Att B - II.J		X		Permit Shield - Applicable Regulations
Att B - III.A		X		Emission Limits/Standards for PM and SO_2
Att B - III.B		X		Monitoring Requirements for Kilns 1, 2, and 3
Att B - III.C		X		Testing requirements for Kilns 1, 2, and 3

Permit Condition	Determination			Comments
	Delete	*Keep*	*Revise*	
Att B - III.D		X		Record Keeping requirements for Kilns 1, 2, and 3
Att B - III.E		X		MACT requirements effective June 10, 2002
Att B - III.F		X		Permit Shield - Applicable Regulations
Att B - IV.A		X		Particulate matter limits/standards and explosives limit
Att B - IV.B		X		Requirements to operate spray bars for the crushing, screening, handling, transporting, and conveying of materials
Att B - IV.C		X		Monitoring requirements for the quarry
Att B - IV.D		X		Testing requirements for the quarry
Att B - IV.E		X		Maintain records of the daily crushed material produced and explosives used
Att B - IV.F		X		Permit Shield - Applicable Regulations
Att B - V.A		X		Particulate matter limits/standards
Att B - V.B		X		Monitoring requirements for the coal preparation operations
Att B - V.C		X		Testing requirements for the coal preparation operations
Att B - V.D		X		Permit Shield - Applicable Regulations
Att B - VI.A		X		Applicability for unclassified sources
Att B - VI.B		X		Particulate matter limits/standards
Att B - VI.C		X		Monitoring requirement for unclassified sources
Att B - VI.D		X		Testing requirement for unclassified sources
Att B - VI.E		X		Permit Shield - Applicable Regulations
Att B - VII.A		X		Emission limits/standards for non-point sources
Att B - VII.B		X		Monitoring requirement for non-point sources
Att B - VII.C		X		Record keeping requirements for non-point sources
Att B - VII.D		X		Permit Shield - Applicable Regulations
Att B - VIII		X		Ambient monitoring requirements

VII. MONITORING AND COMPLIANCE DEMONSTRATION PROCEDURES

A. Continuous Emission Monitoring Systems (CEMS)

The permit requires that the source install, maintain, and operate a CEMS for CO on the Kiln 4 stack because its potential emissions are very close to the PSD threshold. In addition to this CEMS, the source will also be required to demonstrate that the emissions split used in the calculations (i.e. 88 percent of the kiln system emissions will be directed to the Kiln 4 stack and 12 percent will be directed to the Coal Mill stack) is correct. The PTE calculations showed that the only CO emissions from the Coal Mill stack were those that were directed there from the kiln system. These assumptions will be verified with a performance test which will be required for the Coal Mill stack within 180 days after the commencement of operation of the Kiln 4 system. The results of this performance test will be compared to the CEMS readings for the Kiln 4 stack to ensure that the CO emissions from the Coal Mill stack do not exceed 12 percent of the CO emissions from the kiln system. The requirements for NO_x, SO_2, and PM CEMS that were in the previous permit (no. 1001001) were removed from this permit for various reasons which are discussed below.

With regards to the requirement for a NO_x CEMS, the source demonstrated in this permit revision application that the potential NO_x emissions from the source are significantly lower than the current actual emissions. These emissions are not only significantly lower when calculating the potential emissions using the emission factor from the manufacturer's guarantee, but also when using the AP-42 emission factor which is overly conservative. In addition, the source will be performing ambient NO_x monitoring at its facility which will also ensure that there is no negative health impacts to the surrounding community.

In the case of the SO_2 CEMS, the source has opted to utilize a raw feed monitoring plan to monitor the SO_2 emissions rather than SO_2 CEMS. The raw feed monitoring plan requires the source to sample and analyze the raw feed prior to it entering the mill in order to determine the sulfur content of the feed. This information along with the operating hours of the raw mill and the pre-heater and rolling mill SO_2 removal efficiencies will be used to determine the daily SO_2 emission rate. On the last day of every calendar month, the source will calculate the average daily SO_2 emission rate which must be less than or equal to the emission rate used in the PTE calculations (i.e. 0.5 lb per ton of clinker). An initial performance test will be conducted to ensure that the actual SO_2 emissions are consistent with those calculated using the monitoring method described. Monitoring reports will be provided to the Department semiannually.

The PM CEMS has been deferred in accordance with 40 CFR 63.1350(k) pending further rule-making by the EPA.

B. Compliance Assurance Monitoring (CAM)

Pursuant to A.A.C. R18-2-306.A.3.a and 40 CFR Part 64, CAM plans are required for particulate matter emissions from the utility and process dust collectors. The utility dust collectors include DC-200, DC-202, DC-215, DC-216, DC-304, DC-450, DC-451, DC-452, and DC-460. The process dust collector includes DC-453. The CAM plan can be observed in detail in Tables V.A and V.B on the following pages. These CAM provisions are incorporated in the Title V permit.

C. Periodic Monitoring

Pursuant to A.A.C. R18-2-306.A.3.c, the Title V permit for this facility must include periodic monitoring for all emission limitations and standards. This monitoring must be sufficient to yield reliable data from the relevant time period that are representative of compliance with the applicable emission limitation or standard. It may include instrumental or non-instrumental monitoring, periodic emission testing, or record keeping designed to serve as monitoring. All periodic monitoring terms must assure the use of terms, test methods, units, averaging periods, and other statistical conventions consistent with the applicable emission limitation or standard.

The permit contains monitoring, record keeping, and reporting requirements, at least as stringent as those imposed by applicable regulations, which meet the requirements of A.A.C. R18-2-306.A.3.b.

Table VII.A: CAM Plan for Utility Dust Collectors

	Indicator No. 1	Indicator No. 2
I. Indicator	Visible Emissions	Bag Condition
Measurement Approach	Conduct daily visible emissions (VE) observations, and determine opacity if VE are observed	Conduct quarterly internal inspection of the baghouse
II. Indicator Range	An excursion is defined as any time in which VE are observed. Excursions trigger an inspection, corrective action, and a reporting requirement.	Am excursion is defined as failure to perform the semi-annual inspection. Excursions trigger a corrective action and a reporting requirement.
III. Performance Criteria A. Data Representativeness	Observations are performed at the baghouse exhaust while the facility is operating VE: Method 22-like procedures for one minute at the baghouse(s) Opacity: Method 9 by certified observer at the baghouse(s)	Baghouse inspected visually for deterioration
B. Verification of Operational Status	Not Applicable	Not Applicable
C. QA/QC Practices and Criteria	Observer must be Method 9 certified	Trained personnel perform inspections and maintenance
D. Monitoring Frequency	VE: Daily, unless no VE for 7 consecutive days, then weekly; if VE are observed during a weekly observation, the frequency reverts back to daily, until no VE are observed for 7 consecutive days Opacity: Whenever VE are observed	Semi-Annual
E. Data Collection Procedures	VE: Record observer's name, date, time, location, description of visual background during the observation, and the result of the observation Opacity: Record observer's name, date, time, location, and results of the observation	Results of inspections and maintenance activities are recorded in baghouse maintenance log
F. Averaging Period	None	Not Applicable

Table VII.B: CAM Plan for the Process Dust Collector

	Indicator No. 1	Indicator No. 2	Indicator No. 3
I. Indicator	Visible Emissions	Pressure Drop	Bag Condition
Measurement Approach	Conduct daily visible emissions (VE) observations, and determine opacity if VE are observed	Continuously measure the pressure drop through the baghouse using a differential pressure gauge	Conduct quarterly internal inspection of the baghouse
II. Indicator Range	An excursion is defined as any time in which VE are observed. Excursions trigger an inspection, corrective action, and a reporting requirement.	An excursion is defined as a variation beyond the range of pressure drop for a baghouse. Excursions trigger an inspection, corrective action, and a reporting requirement.	Am excursion is defined as failure to perform the semi-annual inspection. Excursions trigger a corrective action and a reporting requirement.
III. Performance Criteria A. Data Representativeness	Observations are performed at the baghouse exhaust while the facility is operating VE: Method 22-like procedures for one minute at the baghouse(s) Opacity: Method 9 by certified observer at the baghouse(s)	An alarm will sound in the control room in an excursion of the pressure drop occurs. If VE are observed at this time, a Method 9 opacity test must be completed immediately.	Baghouse inspected visually for deterioration
B. Verification of Operational Status	Not Applicable	Not Applicable	Not Applicable
C. QA/QC Practices and Criteria	Observer must be Method 9 certified	Pressure taps will be checked weekly for plugging	Trained personnel perform inspections and maintenance
D. Monitoring Frequency	VE: Daily, unless no VE for 7 consecutive days, then weekly; if VE are observed during a weekly observation, the frequency reverts back to daily, until no VE are observed for 7 consecutive days Opacity: Whenever VE are observed	Continuously	Semi-Annual
E. Data Collection Procedures	VE: Record observer's name, date, time, location, description of visual background during the observation, and the result of the observation Opacity: Record observer's name, date, time, location, and results of the observation	Maintain a record of the average hourly pressure drop	Results of inspections and maintenance activities are recorded in baghouse maintenance log
F. Averaging Period	None	None	Not Applicable

VIII. INSIGNIFICANT ACTIVITIES

The applicant has requested that the following activities be deemed as "insignificant". According to A.A.C. R18-2-101.54, for an activity to be deemed "insignificant", there should be no applicable requirement for the activity. This was the basis used to determine if the activities in the following list qualify as an "insignificant" activity under Arizona law.

Table VIII.A: Insignificant Activities

Activity	Determination	Justification
Landscaping	No	Subject to Article 8 regulations
Building maintenance and janitorial activities	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Gasoline storage tanks with a capacity of 10,000 gallons or less	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Diesel and fuel oil storage tanks with a capacity of 40,000 gallons or less	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Hand-held or manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiberboard, masonry, carbon, glass, or wood	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Internal combustion (IC) engine-driven compressors, IC engine-driven electrical generator sets, or IC engine-driven water pumps used only for emergency replacement or standby services	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Lab equipment used exclusively for chemical and physical analysis	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Cafeterias, kitchens, and other facilities used for food or beverage preparation	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Equipment using water, water and soap or detergent, or a suspension of abrasives in water for purposes of cleaning or finishing	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Aerosol can usage	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Acetylene, butane, and propane torches	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Equipment for portable steam cleaning	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j

Activity	Determination	Justification
Blast-cleaning equipment using a suspension of abrasive in water and any exhaust system or collector serving them exclusively	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Lubricating system reservoirs	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Hydraulic system reservoirs	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Adhesive use	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Safety devices such as fire extinguishers	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
General vehicle maintenance and servicing activities	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Storage cabinet for flammable products	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Housekeeping activities and associated products for cleaning purposes and operation of vacuum cleaning systems	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Air conditioning, cooling, heating, or ventilation equipment	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
General office activities such as paper shredding and copying, photographic activities, and blueprinting	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Restroom facilities and associated cleanup operations, stacks, and vents	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Smoking rooms and areas	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Normal consumer use of consumer products, including hazardous substances as defined in the Federal Hazardous Substances Act [15 United States Code 1261 et. seq.]	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j
Operation of mobile sources such as light service trucks (pickups) and employee vehicles	No	Subject to A.A.C. R18-2-604
Various natural gas-fired space heaters and water heaters/boilers that, under A.A.C. R18-2-302(B)(2)(a)(v), are not required to be permitted. These are units that are not fired at a sustained rate of more than 1.0 MM Btu/hr for more than an 8-hour period	Yes	Insignificant pursuant to A.A.C. R18-2-101.57.j

IX. LIST OF ABBREVIATIONS

A.A.C. . . . . Arizona Administrative Code
BACT . . . . . Best Available Control Technology
CAM . . . . . Continuous Assurance Monitoring
CaO . . . . . Lime
CEMS . . . . . Continuous Emission Monitoring System
CFR . . . . . Code of Federal Regulations
CMS . . . . . Continuous Monitoring System
CO . . . . . Carbon Monoxide
CO_2 . . . . . Carbon Dioxide
COM . . . . . Continuous Opacity Monitor
dscf . . . . . Dry Standard Cubic Feet
dscm . . . . . Dry Standard Cubic Meter
EPA . . . . . Environmental Protection Agency
^oF . . . . . Degrees Fahrenheit
FLS . . . . . FL Smidth
g . . . . . Gram
gr . . . . . Grain
kg . . . . . Kilogram
lb . . . . . Pound
MACT . . . . . Maximum Achievable Control Technology
mg . . . . . Milligrams
NAAQS . . . . . National Ambient Air Quality Standards
ng . . . . . Nanogram
NO_2 . . . . . Nitrogen Dioxide
NO_x . . . . . Nitrogen Oxide
NSPS . . . . . New Source Performance Standards
O_3 . . . . . Ozone
OK . . . . . Onoda-Kobe
PCC . . . . . Phoenix Cement Company
PM . . . . . Particulate Matter
PM_{10} . . . . . Particulate Matter Nominally Less Than 10 Microns
PMCD . . . . . Particulate Matter Control Device
PSD . . . . . Prevention of Significant Deterioration
PTE . . . . . Potential-To-Emit
SO_2 . . . . . Sulfur Dioxide
TEQ . . . . . Toxicity Equivalent
VE . . . . . Visible Emissions